ATTITUDES AND BEHAVIOUR TOWARDS CONVENIENCE FOOD AND FOOD WASTE IN THE UNITED KINGDOM

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Abstract

Households in the UK discard much food. A reduction in such waste to mitigate environmental impact is part of UK government policy. This study investigated whether household food waste is linked to a lifestyle reliant on convenience food in younger consumers. A survey of 928 UK residents aged 18-40 years and responsible for the household food shopping (male *n* = 278; female *n* = 650) completed an online questionnaire designed to measure attitudes to convenience food and to quantify household food waste. Cluster analysis of 24 food-related lifestyle factors identified 5 consumer groups. General linear modelling techniques were used to test relationships between the purchase frequency of convenience food and household food waste. From the cluster analysis, five distinct convenience profiles emerged comprising: 'epicures' (*n* = 135), 'traditional consumers' (*n* = 255), 'casual consumers' (*n* = 246), 'food detached consumers' (*n* = 151) and 'kitchen evaders' (*n* = 141). Casual consumers and kitchen evaders were the most reliant on convenience food and notably were the most wasteful. The demographic profile of Kitchen evaders matches the population groups currently targeted by UK policy initiatives aimed at tackling food waste. Casual consumers represent a new and distinct group characterised by "buy a lot and waste a lot" behaviour. Household size, packaging format, price-awareness and marketing all appear to influence levels of food waste. However, it seems that subtle behavioural and sociocultural factors also have impact. Further research is needed to elucidate the factors that mediate the positive association between the purchase of convenience food and reported food waste in order to inform food waste policy and initiatives.

Key Words: Food Waste; Convenience Food; Consumers; Lifestyle

Introduction

Reducing household food waste has been a central tenet of UK environmental policy since 2007 (DEFRA, 2007, 2008). Such a goal stems from the environmental costs of food production, processing, distribution and cooking, which drain limited land, energy and water resources, generate greenhouse gases (GHG) and reduce ecosystem diversity (Garnett, Mathewson, Angelides, & Borthwick, 2015; Macdiarmid et al., 2012). Additionally, food waste that goes to landfill has significant GHG potential; some 250kg of CO_2 equivalents are emitted per tonne of food-based landfill (DEFRA, 2008). In the UK 15 million tonnes are wasted in the food chain annually, of which 7 million tonnes are generated at a household level (Quested, Ingle, & Parry, 2013).

A government-funded charity the *Waste and Resources Action Programme* (WRAP) has been actively working across the UK to reduce household food waste. WRAP instigated a national consumer education campaign in 2008 – *Love Food Hate Waste* – in the wake of a government report showing that householders were generally amenable to changing their food waste behaviour (DEFRA, 2008). However, further to this conclusion, segmentation analysis revealed that there were several consumer groups variously resistant and ambivalent to food waste reduction messages (DEFRA, 2008).

WRAP have identified a number of sequential stages in a 'domestic food cycle' at which food waste occurs; these stages included planning, shopping, storage, preparation and consumption (Flower & Collett, 2014). The causes of avoidable household waste in the cycle are largely due to a combination of organisational and other skills-based constraints that consumers face, as well as external factors such as advertising, packaging format and importantly, confusion over 'use by' and 'best before' dates (Aschemann-Witzel, de Hooge, Amani, Bech-Larsen, & Oostindjer, 2015; Graham-Rowe, Jessop, & Sparks, 2014; Parfitt, Barthel, & Macnaughton, 2010). In a number of surveys it is evident that consumers recognise their food buying behaviour is wasteful, and further there are strong feelings of guilt associated with discarding erstwhile usable food (Brook Lyndhurst, 2007; Evans, 2012; Parizeau, von Massow, & Martin, 2015; Quested, Marsh, Stunell, & Parry, 2013).

The volume of food that a household wastes has been linked to demographic factors and particularly to household size; on a per household basis, total avoidable food waste

increases directly with each additional household member, however larger households produce less waste than smaller households on a *per capita* basis (Joerissen, Priefer, & Braeutigam, 2015; Koivupuro et al., 2012; Parizeau et al., 2015; Quested et al., 2013a). Overall, single person households waste the most food *per capita*, which suggests that economies of scale relating to retail packaging formats are important (Joerissen et al., 2015; Koivupuro et al., 2012; Parizeau et al., 2015; Quested et al., 2013a). There are also some indications that younger people have a greater propensity to waste food (Brook Lyndhurst, 2007). The traditional target groups for household food waste campaigns in the UK are young single professionals, young families and the younger members of lower socioeconomic groups (Brook Lyndhurst, 2007).

Despite an understanding of when waste occurs within the domestic food cycle, the factors and motivations that underpin food waste behaviour are complex. A qualitative research study of English consumers reported that minimising food waste was driven by a desire to save money, however the motive to be a 'good' provider, particularly amongst mothers, led to over-purchasing and consequently greater food wastage (Graham-Rowe et al., 2014). A propensity to waste food has also been aligned to consumerism and the notion of a throwaway society, although clear evidence for this link is lacking (Evans, 2012).

Use of convenience food in the UK has been recognised as central to domestic food provision (Burnett, 1979; DEFRA, 2015). There is a substantial literature on the factors underpinning demand for convenience food (Brunner, van der Horst, & Siegrist, 2010; Buckley, Cowan, & McCarthy, 2007; Shove, 2003). Its popularity can be explained by changes in household demographics such as larger numbers of working women and an inter-generational shift in domestic cooking skills (Brunner et al., 2010; Hartmann, Dohle, & Siegrist, 2013). However, the concept of a convenience food culture integrates aspects of food preparation such as ease of acquisition, serving, eating and storage with management of daily life (Gofton & Ness, 1991; Warde, 1999). It has been proposed that today's complex scheduling of family life gives rise to an unstructured, fragmented approach to eating and meal times; convenience foods reduce cooking responsibility and can address the diversity of food habits within households (Warde, 1997). The use of convenience food might be expected to reduce household food waste as it circumvents the purchase of multiple meal

ingredients; however a Swiss survey reported that convenience food consumption was inversely associated with waste avoidance (Brunner et al., 2010).

This study seeks to explore levels of household food waste against a range of food management activities and attitudes to food consumption that resonate with and reflect a lifestyle dependent on convenience food. A constellation of food management behaviours and attitudes to shopping, cooking and food consumption has been formally developed into a scale, which quantitatively assesses constructs of a convenience food culture (Buckley et al., 2007). We used this scale to measure *inter alia* enjoyment of cooking, meal planning, attitudes to food preparation and clearing up, perception of time-stress, eating-out and food purchasing practices in an attempt to tease out the relationship between the espousal of a convenience food culture and food waste behaviours. The present study explores this axis in a population sample of younger UK consumers who are both known to favour convenience food and report high levels of food waste (Barker, McClean, Thompson, & Reid, 2007; Brook Lyndhurst, 2007).

Methods

Questionnaire Development

The 250-item questionnaire comprised four sections: section 1 related to respondent demographics and section 2 evaluated food waste behaviour. Sections 3 and 4 comprised validated scales (Buckley et al., 2007); these measured attitudinal and behavioural traits associated with food-related activities, as well as items that assessed consumption frequency of convenience food. Sections 3 and 4 were incorporated with the kind permission of Dr McCarthy, University College Cork, Ireland.

Section 1 relating to respondent demographics contained items, which measured household income, household structure, occupational status, educational attainment and regional location along with anthropometric data sufficient to calculate body mass index (BMI; body weight (kg)/ height $(m)^2$).

Section 2 comprised questions regarding food waste behaviour. The quantity of food waste was measured for 14 food categories: fresh fruit, fresh vegetables, salads, milk, cheese, cream and yogurts, eggs, bread, ready cooked meals & other convenience food (pizza, soups

etc.), fruit juice, meat and fish, sandwiches, fizzy drinks and cakes and biscuits. Firstly, the number of food items purchased over a weekly period was recorded, followed by a question asking what percentage of that food was discarded. This frequency scale allows the calculation of the discarded amount relative to the amount purchased and adopts the approach previously taken by Stefan *et al.* and Visschers *et al.* (Stefan, van Herpen, Tudoran, & Lähteenmäki, 2013; Visschers, Wickli, & Siegrist, 2015). Ten additional questions were posed to assess attitudes to food waste and ascertain reasons for discarding food.

Attitudinal and behavioural traits associated with food-related activities were measured using multiple series of convenience and food lifestyle statements, to which respondents were required to indicate their degree of agreement on a seven-point Likert scale (1 = completely disagree; 7 = completely agree). Questions were phrased both positively and negatively to corroborate answers, and questions were posed randomly to mitigate 'order' effects. These items comprised section 3.

To measure consumption frequency of convenience food (section 4), respondents were asked how often they bought certain categories of ready meals such as frozen or chilled, the frequency with which they went out for a meal, bought a takeaway to eat at home and cooked a meal from ingredients. The seven-point frequency scale ranged from 'every day or almost every day' to 'never'.

Data Collection

Ethical approval for the study was obtained through the School of Medicine's ethical review procedure at the University of Sheffield. Respondents were provided with online information about the study prior to their participation and their consent was affirmed before they had access to the online questionnaire. The study information emphasised that all responses would be used for academic research only and that no identifying information would be collected. Repeat participation was prevented by eliminating duplicate IP addresses; IP data were subsequently removed from the downloaded survey file.

The questionnaire was implemented using a proprietary online survey tool (Qualtrics; Utah, USA). The questions were encoded onto the Qualtrics platform, which supports logical,

sequential questioning based on prior responses; respondents, for example, who report they live alone were not asked questions relating to other members of the household.

Suitable participants were recruited by Qualtrics that met three pre-specified criteria: having responsibility for the majority of the household food shopping, habitually resident in the UK and aged between 18 and 40. Qualifying participants were drawn from Qualtrics' existing survey panel and were compensated with cash-equivalent rewards (e.g. points towards restaurant vouchers or cinema tickets).

A number of data integrity checks were built into the questionnaire in the form of 'attention filters' requiring respondents to provide a specific response to a question; those that failed to do so were assumed not to be giving each question due consideration and were excluded from the survey sample.

A pilot launch, which involved running the questionnaire for 48-hours with a small subset of respondents (n = 111), was conducted in order to confirm that the questionnaire operated as intended. In total 1059 qualifying responses were collected during the period 10-17 June 2015. These raw data were scrutinised for reliability and 131 responses were excluded from the data set because of inconsistencies across key demographic variables, yielding a final sample size of 928. Detailed demographic characteristics of the sample are summarised in Table 1.

Statistical Analysis

The lifestyle statements were analysed and initially grouped into 27 distinct constructs of which 19 were identified in the previously published study (Buckley et al., 2007). Content validity of the additional 8 constructs was examined, and the face validity of all 27 was assessed prior to testing the internal consistency using Cronbach's alpha coefficient which ranged from 0.64 to 0.92. The constructs and associated reliability coefficients are presented in Table 2. The statements underlying each construct are listed in Table A1 in the appendix.

A k-means cluster analysis used 24 of the 27 constructs as clustering variables to identify distinct consumer segments. The 3 constructs that were excluded from the cluster analysis related to family-orientated questions which were not applicable to single people. The

inclusion of these constructs would have eliminated an important subsample (single households). Groupings ranging between 4 and 7 segments were tested and Roy's Largest Root values were used to select the 5-segment solution. This procedure is similar to the standard method of 'best cut' where clusters are identified by levels of differentiation between groups (Everitt, Landau, Leese, & Stahl, 2011).

Statistical analysis using general linear modelling techniques, principally one-way ANOVA, were used to test the significance of the relationship between the food waste measures and the consumption frequency of takeaway food and ready meals for each of the cluster groups. The statistical analysis was conducted using SPSS (IBM SPSS 22.0, IBM Armonk, USA) and a P-value of less than 0.05 was the criterion for statistical significance.

The demographic characteristics and BMI values of the five groups were analysed using one way ANOVA and the means compared using the chi-square test. The attitudes of the five groups towards the lifestyle factors were analysed and subsequently ranked for each factor using a multivariate general linear model and either *post hoc* Tukey's Honestly Significant Difference (HSD) tests or Games-Howell (G-H) tests as appropriate (Table 3). Attitudes towards the three sets of family-orientated questions were similarly analysed (Table 4), as were the consumption frequencies for ready meals and take-away food (Table 5).

Results

The survey sample (n = 928) was geographically diverse and representative of the regions and countries within the UK, and comprised respondents with a wide range of occupational and educational backgrounds. The mean age of the sample was 30.0 years (SD 6.0) and 70% were female (Table 1). The female bias in the sample is consistent with data published by the Food Standards Agency on the proportion of women responsible for household food and grocery shopping (68%) (Prior, Phillips, & O'Driscoll, 2014).

Cluster analysis based on the 24 lifestyle factors applicable to all survey respondents identified five consumer groups distinguishable by distinct lifestyle characteristics: epicures (n = 135), traditional consumers (n = 255), casual consumers (n = 246), food detached consumers (n = 151) and kitchen evaders (n = 141).

There were significant differences between consumer groups for all demographic variables (Table 6&7), however BMI values were similar across all consumer groups (P = 0.144).

Epicures contained the highest proportion of consumers educated to at least undergraduate degree level (56.3%), and also had the highest overall household income (£39,342 per annum). This group contained a majority of one and two-person households. Traditional consumers (TCs) were the second most educated and had the second highest household income (£33,392 per annum).

Casual consumers (CCs) were the least female dominated group (61.0%) and had the fewest single-person households (10.6%). A smaller proportion of CCs had attained an undergraduate degree (40.7%). They were slightly younger than both Epicures and TCs and also earned slightly less than the latter group.

Food detached consumers (FDs) were on average the oldest group (30.9 years). Less than 40% of FDs had attained an undergraduate degree and their household income was the second lowest (£29,500 per annum), despite their household size being the second highest.

Kitchen evaders (KEs) represented the youngest consumer group (28.5 years). This group was the most female dominated (77.3%) and contained the largest number of single-person households (19.9%). KEs were the least well educated, with the majority not having studied beyond A-level, and reported the lowest household income of all consumer groups (£24,989 per annum).

Food waste behaviour for each of the consumer groups was calculated using the frequency scale, allowing the discarded amount to be reported relative to the amount purchased. Fresh produce accounted for the biggest proportion of food waste overall: fresh vegetables were the most wasted (8.6%) followed by fresh fruit (8.1%). Percentage food waste by consumer group, total food items purchased and discarded are shown in Figures 1-3.

Figure 4 describes the waste behaviour of each consumer group with respect to leftover food, food cooked but not served, food stored from previous meals, and both partially used and unopened products that are discarded.

The attitudinal and behavioural characteristics of the five consumer groups with respect to the various lifestyle factors and to convenience food and food waste are summarised below:

Epicures

Epicures accounted for 14.5% of the sample and exhibited very distinct attitudinal and behavioural traits compared to the other consumer groups: they were disinterested in convenience food (Table 3) and displayed the most negative sentiments towards the enjoyment, value for money and time-saving aspects of convenience food. Contrastingly, they were the most interested in the provenance of their food, displayed the strongest preference for both fresh and organic produce and, whilst being the most price-conscious, they were also most likely to seek out specialist purveyors.

As a group, Epicures were the most organised and regarded the availability of product information as important; they positively enjoyed trying new foods, rated themselves as the most competent cooks and were the least likely to snack, rarely used the microwave and most frequently cooked from scratch (Tables 3&5).

Epicures reported being the least pressed for time and the lowest levels of stress among all of the consumer groups (Table 3); they enjoyed the highest level of family involvement and family members were very unlikely to be 'fussy eaters' (Table 4). This group reported buying the least ready meals and take-away food, which was consistent with their overall negative attitude towards convenience food (Table 5).

Epicures were the least likely to own certain convenience-related kitchen equipment such as a microwave (88.1%) or an electric potato peeler (0.7%); however they were the most likely to own other items such as a food processor (65.9%), cappuccino/espresso maker (30.4%), bread maker (27.4%) and an ice cream maker (14.1%) (Table 8).

Epicures were the least wasteful of the five consumer groups, reportedly discarding only 2.5% of total food purchased; this low level of waste was consistent across all 14 food categories (Figure 1A&B). Low wastage also extended to plate waste and surplus cooked food (Figure 4). Epicures reported high levels of concern over discarded food (between 'a fair amount' and 'a great deal').

Traditional consumers

TCs made up 27.5% of the sample and collectively they were either neutral or reported a moderate tendency to adopt the various lifestyle factors (Table 3).

Similar to Epicures they were family-orientated (albeit to a lesser extent) (Table 5); TCs reported being somewhat pressed for time, but not particularly stressed. This group had marginally negative sentiments towards convenience food but, unlike Epicures, they appreciated its time saving aspect, albeit recognising the associated cost (Table 3).

TCs scored highly on planning and reported being very price-conscious and willing to try new foods. Like Epicures, they were very interested in food, were competent cooks and enjoyed high levels of satisfaction from the regular preparation of meals and the associated social interaction. TCs highly valued fresh produce; however they were only slightly interested in organic produce and were indifferent to shopping for food in specialist shops (Table 3).

TCs reported a low enjoyment of ready meals and take-away food (Table 3), reflected in their correspondingly low consumption rates for each (Table 5).

TCs reported discarding 4.5% of their total purchased food and were the middle group when ranked by waste in almost all of the food categories (Figure 1A&B). Like the Epicures they also reported high levels of concern over discarded food (between 'a fair amount' and 'a great deal').

Casual consumers

CCs comprised 26.5% of the sample. This group reported being moderately stressed and pressed for time: they only occasionally planned meals in advance and were the most likely of all groups to snack instead of adhering to set meal times (Table 3). Of all the consumer groups, CCs were the most positive towards convenience food reflected by their reported enjoyment of take-away food and ready meals of which they were the second highest consumers (Table 5). The taste and appeal of food was least important to this group and they were the least price-conscious (Table 3).

CCs were not particularly interested in food shopping and were indifferent to shopping in specialist shops. However, they expressed a preference for fresh products and bought organic food. The group possessed average cooking skills and had a limited enjoyment of cooking; they were not averse to trying unfamiliar foods and were moderately willing to attempt new recipes. CCs were the most likely to be influenced by advertising (Table 3). CCs

were likely to have fussy eaters within the family and were the least likely to adhere to family mealtimes (Table 4).

CCs possessed a wide range of kitchen equipment and were the most likely to own a microwave (95.1%), dishwasher (41.2%), electric knife (13.8%), an electric potato peeler (4.5%) and almost a third owned a juicer (32.9%) (Table 8).

In aggregate CCs both bought and discarded the most foodstuffs overall (Figures 2A&B and 3A&B), they reported discarding an average of 7.6% of food purchases. CCs threw away 10.0% of fresh vegetables, 9.8% of fresh fruit and wasted the largest proportion of all other foods (Figure 1A&B). This high level of waste was mirrored in their reported plate waste, surplus cooked food or food from previous meals and both partially used and unopened products (Figure 4). CCs reported moderate concern over discarding food (between 'a little' and 'a fair amount').

Food detached consumers

FDs accounted for 16.3% of the sample and were characterised by ambivalence to all aspects of meal planning, preparation, and to food in general: in this respect they were the opposite of epicures. Compared to other groups the taste and appeal of food was relatively unimportant, they were unwilling to try new food and were least likely to engage in the social aspects of mealtimes (Table 3).

These consumers had a tendency to dislike food shopping and although FDs expressed a modest preference for fresh products they did not seek out organic foods. This group placed low importance on product information and were unlikely to use speciality shops (Table 3).

FDs reported that they did not feel stressed and were not particularly pressed for time, however, they reported lower than average cooking skills and did not enjoy cooking (Table 3). Family members were unlikely to be 'fussy eaters', they did not snack and generally adhered to set meal times, however, they were unlikely to involve the whole family in meal preparation (Tables 3&4).

FDs had a negative attitude towards convenience food, although they moderately acknowledged its time saving benefit (Table 3): they did not enjoy ready meals and take-

away food, which was reflected in their correspondingly low consumption (Table 5). This group felt that convenience food was not good value for money (Table 3).

FDs wasted 3.3% of total purchased food and were the second least wasteful in the majority of the 14 food categories; which was also reflected in their behaviour towards food waste (Figure 4). Similar to the CCs they reported moderate concern about discarding food.

Kitchen evaders

KEs comprised 15.2% of the sample and had the largest proportion of single person households (19.9%). Along with CCs, they were most likely to rate convenience food highly; they expressed enjoyment of both ready meals and take-away food and rated the value for money of convenience food as the highest of all the consumer groups. KEs were the most pressed for time and appreciated the time saving benefits of convenience food the most (Table 3).

KEs disliked food shopping the most; they were the least interested in product information and were least likely to plan ahead. They expressed only a mild preference for fresh products and were the least likely to buy organic foods or to use specialist shops (Table 3). KEs reported the lowest cookery skills and derived the least enjoyment from meal preparation; this was reflected in the frequency with which KEs scratch cooked which was the lowest of all groups (Table 5).

The social aspects of mealtimes were unimportant to KEs and they were most likely to avoid cooking when alone and moderately likely to snack in place of a meal. Of the five consumer groups KEs reported the highest combined consumption of ready meals and take-away food (Tables 3&5).

Consistent with their group name, KEs possessed the least amount of kitchen equipment, with the exception of the microwave for which they reported the second highest ownership (Table 8).

KEs were the second most wasteful group, they reported discarding an average of 5.2% of their total food purchases. They discarded the greatest percentage of fresh produce: 12.7% and 11.1% of purchased vegetables and fruit, respectively. KEs also reported discarding the most plate waste, surplus cooked food or food from previous meals and partially used and

unopened products (Figure 4). KEs reported moderate concern in relation to discarded food (between 'a little' and 'a fair amount').

Discussion

This study explored the dynamics of household food waste among younger consumers of convenience food. Profiling based solely on a food-related lifestyle identified five distinct consumer groups, with diverse behavioural characteristics in relation to both the consumption of convenience food and to food waste. Further analysis of the groups' demographic characteristics highlighted differences in income, education and household composition.

Three of these groups, Epicures, TCs and KEs, displayed convenience profiles similar to those identified in a large study of food consumers in Great Britain carried out in 2002 (Buckley et al., 2007). Epicures and TCs closely resembled the 'food connoisseurs' and 'home meal preparers' of the 2002 study in their motivations to cook from scratch and their appreciation of home cooking. The third comparable group, KEs, had practically identical convenience food behaviours to the KEs identified in the earlier study; this congruence has been reflected in retention of the group's name.

The fourth and fifth groups (CCs and FDs) had very different profiles. CCs did not spend much time preparing food or shopping and whilst they gravitated towards convenience food, gourmet and social aspects of food consumption remained important. FDs in contrast, were manifestly disinterested in all food-related activities. The convenience profile of FDs mirrored that of 'uninvolved food consumers' identified in a pan-European study (Grunert, Brunsø, Bredahl, & Bech, 2001); some behavioural traits also resonated with the British study's segment of 'convenience seeking grazers' (Buckley et al., 2007). The CCs identified here appear to represent a new and distinct group that have pronounced consumerist tendencies.

Compared with the other groups CCs and KEs reported demonstrably higher levels of all types of food waste: fresh produce, leftovers and both unopened and partially used foodstuffs. Notably it was these two groups that were the most positive towards convenience food. KE's predilection for ready meals and takeaway food may be related to their reports of poor culinary skills and limited time spent in the kitchen. Studies have

shown that the use of convenience food is inversely proportional to cooking ability (Brunner et al., 2010; Hartmann et al., 2013). Unlike KEs, CCs possessed reasonable culinary skills and moderately enjoyed cooking; suggesting that CC's reliance on convenience food was due to other factors.

The high proportion of food waste generated by KEs and CCs could be attributable to their apparent lack of advance planning. However, there also appears to be other reasons for their food waste. KEs comprised the group with the largest proportion of single person households. The standard size of pre-packaged food tends to be too large for single person households and yet the cost of smaller formats is disproportionately expensive (Aschemann-Witzel et al., 2015; Evans, 2012; Koivupuro et al., 2012). In contrast to KEs, CCs comprised the largest average household size, which might render them better positioned to take advantage of economies of scale, however CCs were the most wasteful consumer group. It is plausible that their high level of waste is an adjunct to this group's low frequency of consumption of family meals and their need to accommodate 'fussy eaters'. Research indicates that children can disproportionally influence household food waste through plate waste and fussy eating (Cappellini & Parsons, 2013; Evans, 2012). In addition, qualitative evidence suggests that over-provision driven by the desire to be a 'good' provider increases the amount of food going to waste (Carrigan et al., 2006; Evans, 2012; Graham-Rowe et al., 2014).

Furthermore, fragmentation of mealtimes encourages greater reliance on convenience food. Warde (1999) offers a sociological perspective on the use of convenience food: he suggests that it is the 'de-routinisation' of people's lives that increases the requirement for convenience food. Family members are often in the wrong place at set mealtimes, for reasons that are either planned or unintended. In this argument, the reason for reliance on convenience food is shifted from time- and labour-saving to time-scheduling (Warde, 1999); CCs might therefore make greater use of convenience food to remedy the temporal problem of meal arrangements. Ethnographic studies note that the time-scheduling issue manifests during the negotiation of daily routines and that unpredicted changes of plan are a major structural cause of food becoming waste (Evans, 2012; Watson & Meah, 2012).

CCs were also the most influenced by advertising and the least price-conscious, which may have a bearing on their excessive food purchases and corresponding high level of food

waste. Studies indicate that promotional campaigns by supermarkets, such as multi-buy and '*buy one get one free*', encourage unnecessary purchases that lead to additional food waste (Brook Lyndhurst & WRAP, 2010). There may be ways to encourage discount shopping that does not lead to wasteful behaviour, such as vouchers for later purchases or product donation schemes (Dobson & Gerstner, 2010).

In contrast with CCs and KEs, Epicures largely rejected convenience food and generated the least food waste overall. Notably, Epicures were the most likely to make shopping lists based on meal plans, consistent with WRAP's advice aimed at reducing food waste (Quested & Luzecka, 2014). Epicures reported wide appreciation for food-related activities, were the most interested in the provenance of their food and cooked from scratch on average five times per week. A greater frequency of cooking is likely to enhance wider skills such as more precise portion control, which in turn reduces food waste (Graham-Rowe et al., 2014; Joerissen et al., 2015).

The findings of this study positively reinforce the findings of the previous study carried out in Great Britain in 2002 (Buckley et al., 2007). However, it does have limitations in several areas, which must be considered in discussion. Firstly, our waste measurement was quantified as a discarded amount relative to an amount purchased and therefore can only be interpreted against similarly scored methods. Furthermore, self-reported waste is known to be subject to social pressures, perhaps resulting in under-reporting (Quested, Parry, Easteal, & Swannell, 2011). Nevertheless, the ranking of the level of waste across the various food groups reflects the empirically measured waste data collected by WRAP; namely a pattern of greater waste for fresh vegetables and salads, fresh fruit, bread, meals, dairy and eggs (Quested et al., 2013a). In addition our measure of waste did not distinguish between avoidable and unavoidable waste; some 40% of household food waste is unavoidable being the inedible fraction of food (Quested et al., 2013a). Whilst reported food waste was positively associated with the purchase of convenience food, it is unclear whether this association is causal or if the behaviour patterns that lead to reliance on convenience food also create food waste. Secondly, there are issues in relation to response and sample bias. It is plausible that there is an over-representation of Epicures and under-representation of KEs and FDs because of selection bias towards people interested in food. It is also likely that there is under-representation of both top- and bottom-earners, because

433 the former group have no financial impetus to participate, while the latter group have low
434 levels of internet access.

435 The traditional target groups for household food waste campaigns in the UK are young
436 single professionals, young families and the younger members of lower socioeconomic
437 groups (Brook Lyndhurst, 2007). Food waste messages focus on knowledge and skill
438 limitations of these specific consumers (Brook Lyndhurst, 2007; Flower & Collett, 2014). The
439 profile of the KEs overlaps with these target groups, which support WRAP'S current strategy.

440 However, we have highlighted another distinct consumer group, CCs, whose wasteful
441 behaviour appears to be the result of firmly established behavioural and attitudinal
442 interactions that combine with household dynamics to give rise to increased food waste.
443 CCs represent a large consumer group (more than a quarter of respondents); they strongly
444 identify with a convenience food lifestyle exhibiting distinct consumerist behaviour. On a
445 *per capita* basis CCs bought 13.4% more food compared with the other groups, however
446 reported BMIs were similar to other groups, which suggests that the problem is over-
447 provisioning as opposed to over-consuming. It is evident from their levels of food waste
448 that CCs are habitually discarding their superfluous grocery purchases. These consumerist
449 traits were also apparent in their ownership patterns of convenience-related kitchen
450 equipment, even though they reported limited propensity to cook. Such consumerism may
451 be underpinned by other subtle psychological and sociocultural factors, which need to be
452 considered when developing initiatives to tackle food waste. Further research is needed to
453 elucidate the factors that mediate the positive association between the purchase of
454 convenience food and reported food waste

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References

Aschemann-Witzel, J., de Hooge, I., Amani, P., Bech-Larsen, T., & Oostindjer, M. (2015). Consumer-Related Food Waste: Causes and Potential for Action. *Sustainability*, *7*(6), 6457–6477. http://doi.org/10.3390/su7066457

Barker, M. E., McClean, S. I., Thompson, K. A., & Reid, N. G. (2007). Dietary behaviours and sociocultural demographics in Northern Ireland. *British Journal of Nutrition*, *64*(02), 319-329. http://doi.org/10.1079/BJN19900034

Brook Lyndhurst. (2007). *Food behaviour consumer research: Quantitative stage*. UK: WRAP.

Brook Lyndhurst & WRAP. (2010). *Helping consumers reduce food waste – a retail survey*. Banbury: WRAP.

Brunner, T. A., van der Horst, K., & Siegrist, M. (2010). Convenience food products. Drivers for consumption. *Appetite*, *55*(3), 498–506. http://doi.org/10.1016/j.appet.2010.08.017

Buckley, M., Cowan, C., & McCarthy, M. (2007). The convenience food market in Great Britain: convenience food lifestyle (CFL) segments. *Appetite*, *49*(3), 600–617. http://doi.org/10.1016/j.appet.2007.03.226

Burnett, J. (1979). *Plenty and Want: A social history of diet in England from 1815 to present day* (2nd Editio). London: Scholar Press.

Cappellini, B., & Parsons, E. (2013). Practising Thrift at Dinnertime: Mealtime Leftovers, Sacrifice and Family Membership. *The Sociological Review*, *60*(S2), 121–134. http://doi.org/10.1111/1467-954X.12041

Carrigan, M., Szmigin, I., & Leek, S. (2006). Managing routine food choices in UK families: The role of convenience consumption. *Appetite*, *47*(3), 372–383. http://doi.org/10.1016/j.appet.2006.05.018

DEFRA. (2007). *Waste Strategy for England 2007*. Department for Environment Food and Rural Affairs, 127. London: HMSO. Retrieved from http://archive.defra.gov.uk/environment/waste/strategy/strategy07/documents/waste07-strategy.pdf

DEFRA. (2008). *A framework for pro-environmental behaviours*. Retrieved from www.defra.gov.uk\nhttp://www.defra.gov.uk/evidence/social/behaviour/pdf/behaviours-jan08-report.pdf

DEFRA. (2015). *Family Food 2014*. London: DEFRA.

Dobson, P. W., & Gerstner, E. (2010). Wasteful Pricing. Unpublished Presentation at: INFORMS Marketing Science Conference, June 2010, Cologne, Germany.

Evans, D. (2012). Beyond the Throwaway Society: Ordinary Domestic Practice and a Sociological Approach to Household Food Waste. *Sociology*, *46*(1), 41–56. http://doi.org/10.1177/0038038511416150

Everitt, B. S., Landau, S., Leese, M., & Stahl, D. (2011). *Cluster Analysis* (5th Editio). Chichester: John Wiley & Sons Ltd.

Flower, T., & Collett, K. (2014). Survey of Existing Consumer Products and Services which

Reduce Food Waste. WRAP & Shift. Retrieved August 15, 2015, from www.shiftdesign.org.uk/content/uploads/2014/09/shift_Food-Waste_survey.pdf

Garnett, T., Mathewson, S., Angelides, P., & Borthwick, F. (2015). *Policies and actions to shift eating patterns: What works?* Food Climate Research Networkand Chatham House: Oxford UK

Gofton, L., & Ness, M. (1991). Twin Trends : Health and Convenience in Food Change or Who Killed the Lazy Housewife ? *British Food Journal 93*(7), 17–23.

Graham-Rowe, E., Jessop, D. C., & Sparks, P. (2014). Identifying motivations and barriers to minimising household food waste. *Resources Conservation and Recycling*, *84*, 15–23. http://doi.org/10.1016/j.resconrec.2013.12.005

Grunert, K. G., Brunsø, K., Bredahl, L., & Bech, A. C. (2001). Food-Related Lifestyle: A segmentation Approach to European Food Consumers. In L. J. Frewer, E. Risvik, & H. Schifferstein (Eds.), *Food, People and Society: A European Perspective of Consumers' Food Choices* (pp. 211–229). Berlin: Springer.

Hartmann, C., Dohle, S., & Siegrist, M. (2013). Importance of cooking skills for balanced food choices. *Appetite*, *65*, 125–131. http://doi.org/10.1016/j.appet.2013.01.016

Joerissen, J., Priefer, C., & Braeutigam, K.-R. (2015). Food Waste Generation at Household Level: Results of a Survey among Employees of Two European Research Centers in Italy and Germany. *Sustainability*, *7*(3), 2695–2715. http://doi.org/10.3390/su7032695

Koivupuro, H.-K., Hartikainen, H., Silvennoinen, K., Katajajuuri, J.-M., Heikintalo, N., Reinikainen, A., & Jalkanen, L. (2012). Influence of socio-demographical, behavioural and attitudinal factors on the amount of avoidable food waste generated in Finnish households. *International Journal of Consumer Studies*, *36*(2), 183–191. http://doi.org/10.1111/j.1470-6431.2011.01080.x

Macdiarmid, J. I., Kyle, J., Horgan, G. W., Loe, J., Fyfe, C., Johnstone, A & McNeill G. (2012). Sustainable diets for the future : can we contribute to reducing greenhouse gas emissions by eating a healthy diet? *American Journal of Clinical Nutrition*. http://doi.org/10.3945/ajcn.112.038729.

Parfitt, J., Barthel, M., & Macnaughton, S. (2010). Food waste within food supply chains: quantification and potential for change to 2050. *Philosophical Transactions of the Royal Society B-Biological Sciences*, *365*(1554), 3065–3081. http://doi.org/10.1098/rstb.2010.0126

Parizeau, K., von Massow, M., & Martin, R. (2015). Household-level dynamics of food waste production and related beliefs, attitudes, and behaviours in Guelph, Ontario. *Waste Management*, *35*, 207–217. http://doi.org/10.1016/j.wasman.2014.09.019

Prior, G., Phillips, R., & O'Driscoll, C. (2014). *Food and You Survey Wave 3; UK Bulletin 1: Eating, cooking and shopping*. London: Food Standards Agency.

Quested, T. E., Marsh, E., Stunell, D., & Parry, A. D. (2013b). Spaghetti soup: The complex world of food waste behaviours. *Resources Conservation and Recycling*, *79*, 43–51. http://doi.org/10.1016/j.resconrec.2013.04.011

Quested, T. E., Parry, A. D., Easteal, S., & Swannell, R. (2011). Food and drink waste from households in the UK. *Nutrition Bulletin*, *36*(4), 460–467. http://doi.org/10.1111/j.1467-3010.2011.01924.x

Quested, T., Ingle, R., & Parry, A. (2013a). *Household Food and Drink Waste in the United Kingdom 2012*. Banbury: WRAP.

Quested, T., & Luzecka, P. (2014). *Household food and drink waste: A people focus*. Banbury: WRAP.

Shove, E. (2003). Converging conventions of comfort, cleanliness and convenience. *Journal of Consumer Policy*, *26*(4), 395–418. http://doi.org/10.1023/A:1026362829781

Stefan, V., van Herpen, E., Tudoran, A. A., & Lähteenmäki, L. (2013). Avoiding food waste by Romanian consumers: The importance of planning and shopping routines. *Food Quality and Preference*, *28*(1), 375–381. http://doi.org/10.1016/j.foodqual.2012.11.001

Visschers, V. H. M., Wickli, N., & Siegrist, M. (2015). Sorting out food waste behaviour: A survey on the motivators and barriers of self-reported amounts of food waste in households. *Journal of Environmental Psychology*, *45*, 66–78. http://doi.org/10.1016/j.jenvp.2015.11.007

Warde, A. (1997). *Consumption Food & Taste*. London: SAGE Publications Ltd.

Warde, A. (1999). Convenience food: space and timing. *British Food Journal*, *101*(7), 518–527.

Watson, M., & Meah, A. (2012). Food, waste and safety: negotiating conflicting social anxieties into the practices of domestic provisioning. *The Sociological Review*, *60*, 102–120. http://doi.org/10.1111/1467-954X.12040

Tables and Figures

Table 1: Demographic characteristics of sample n = 928 (number and (%))

	Sample
Gender:	
Male	278 (30%)
Female	650 (70%)
Age Range:	
18-25	244 (26.3%)
26-30	227 (24.5%)
31-35	260 (28.0%)
36-40	197 (21.2%)
Mean	30 years
BMI mean (S.D.)	25.9 kg/m^2 (7.0)
Highest level of education attained	
G.C.S.E.	168 (18.1%)
AS/A Level	219 (23.6%)
Further education (diploma etc)	135 (14.5%)
Degree	315 (33.9%)
Postgraduate	91 (9.8%)
Occupational status:	
Employed full time (≥ 30 hrs/wk)	495 (53.3%)
Employed part time (15-29 hrs/wk)	157 (16.9%)
Working less than 15 hrs/wk	17 (1.8%)
Unemployed	43 (4.6%)
Student	85 (9.2%)
Homemaker	91(9.8%)
Other	40 (4.3%)
No. of people in household:	
1	127 (13.7%)
2	275 (29.6%)
3	230 (24.8%)
4	194 (20.9%)
5	71 (7.7%)
6 or more	31 (3.3%)
Mean household income (S.D.)	£31,825 (24,101)
Regional distribution:	
North East	50 (5.4%)
North West	123 (13.3%)
Yorkshire & The Humber	75 (8.1%)
East Midlands	58 (6.3%)
West Midlands	76 (8.2%)
East of England	79 (8.5%)
London	110 (11.9%)
South East	139 (15%)
South West	93 (10.0%)
Scotland	54 (5.8%)
Wales	54 (5.8%)
Northern Ireland	17 (1.8%)

566 **Table 2**: Lifestyle factors and associated Cronbach's α coefficient reliability scores for each factor.

Lifestyle Factor		Cronbach's α
1.	Pro convenience food	0.92
2.	Cooking satisfaction	0.86
3.	Trying new food	0.88
4.	Preference for fresh products	0.82
5.	Food shopping	0.80
6.	Pressed for time	0.78
7.	Price conscious	0.77
8.	Meal plan	0.80
9.	Propensity to waste ingredients	0.82
10.	Checking labels	0.79
11.	Social eating	0.79
12.	Woman's work	0.75
13.	Life stress	0.85
14.	Regular microwave usage	0.87
15.	Snacking in place of meals	0.73
16.	Tendency not to cook when alone	0.71
17.	Time benefits of convenience food	0.89
18.	Specialist shoppers	0.64
19.	Cooking ability	0.80
20.	Enjoyment of ready meals and takeaways	0.86
21.	Influenced by advertising	0.72
22.	Organic food products	0.86
23.	Value for money – convenience food	0.73
24.	Taste/appeal of food	0.79
25.	Fussy eaters within the family	0.78
26.	Family help	0.69
27.	Breakdown of family mealtimes	0.79

567 Lifestyle factors 25, 26 and 27 were not included in the cluster analysis because these factors excluded single person
568 households.

569

570 **Table 3:** Categorisation of respondents based on mean score and Tukey Honestly Significant Differences or
571 Games-Howell tests where appropriate.

	Epicures	Traditional consumers	Casual consumers	Food detached consumers	Kitchen evaders
Pro convenience food	Very negative	Slightly negative	Positive	Negative	Positive
Cooking satisfaction	Highest	High	Moderate	Low	Lowest
Trying new food	Most willing	Willing	Moderately willing	Not willing	Not willing
Preference for fresh products	Highest	High	Marginal	Marginal	Marginal
Food shopping	Most likely to enjoy	Likely to enjoy	Don't enjoy	Don't enjoy	Least likely to enjoy
Pressed for time	Least	Somewhat	Somewhat	Neither agree nor disagree	Most
Price conscious	Most	Very	Least	Price conscious	Price conscious
Meal plan	Most likely	Likely	Sometimes	Sometimes	Least likely
Propensity to waste ingredients	Very unlikely	Somewhat unlikely	Likely	Unlikely	Neither likely nor unlikely
Checking labels	Likely	Likely	Somewhat likely	Least likely	Least likely
Social eating	Important	Important	Important	Not important	Not important
Woman's work	Disagree	Disagree	Indifferent	Disagree	Strongly disagree
Life stress	Very low	Low	Moderate	Very low	Moderate
Regular usage of microwave	Least likely	Rather unlikely	Most likely	Unlikely	A little unlikely
Snacking in place of meals	Very unlikely	Unlikely	More likely	Very unlikely	More likely
Tendency not to cook when alone	Very unlikely	Somewhat likely	Somewhat likely	Somewhat likely	Very likely
Time benefits of convenience food	Least appreciative	Appreciate	Appreciate	Somewhat appreciate	Most appreciative
Specialist shoppers	Most likely	Indifferent	Indifferent	Unlikely	Unlikely
Cooking ability	Very competent	Competent	Average	Low	Lowest
Enjoyment of ready meals and takeaways	Very low	Somewhat low	High	Low	High
Influenced by advertising	Unlikely	Indifferent	Most likely	Least likely	Unlikely
Organic food products	May buy	May buy	May buy	Unlikely to buy	Most unlikely to buy
Value for money - convenience food	Disagree	Slightly disagree	Somewhat agree	Slightly disagree	Somewhat agree
Taste/appeal of food	Extremely important	Extremely important	Important	Very Important	Highly important

572

573 **Table 4:** Responses to family-orientated questions by cluster membership (multiple person households only: *n* = 763)

	Epicures	Traditional consumers	Casual consumers	Food detached consumers	Kitchen evaders	*P*-value
Fussy eaters in the family	Very unlikely	Unlikely	Likely	Unlikely	Likely	*P* <0.001
Family helps with food preparation	Likely	Likely	Likely	Unlikely	Unlikely	*P* <0.001
Breakdown of family mealtimes	Strongly disagree	Disagree	Agree	Disagree	Somewhat disagree	*P* <0.001

574

575 **Table 5:** Average weekly frequency of various convenience food behaviours by cluster group (cluster ranking)

	Epicures	Traditional consumers	Casual consumers	Food detached consumers	Kitchen evaders	*P*-value
Cook a meal from ingredients	5.1 (1)†	4.1 (2)†	2.6 (4)†	3.3 (3)†	2.0 (5)†	*P* < 0.001
Buy a takeaway meal to eat away from home	0.1 (5)a	0.2 (4)	0.5 (1)†	0.2 (3)	0.3 (2)a	*P* < 0.001
Buy a takeaway meal to eat at home	0.3 (5)ab	0.4 (3)cd	0.7 (2)ace	0.3 (4)ef	0.7 (1)bdf	*P* < 0.001
Go out for a meal	0.4 (3)	0.4 (4)b	0.6 (1)ab	0.3 (5)a	0.4 (2)	*P* = 0.001
Do not eat a 'proper' meal just snack	0.3 (5)abc	0.8 (3)ad	1.0 (2)be	0.5 (4)ef	1.4 (1)cdf	*P* < 0.001
Eat ready meals	0.3 (5)†	0.7 (3)	1.0 (2)†	0.5 (4)	1.5 (1)†	*P* < 0.001
Ready meal form:						
Frozen	0.1 (5)†	0.4 (3)ab	0.8 (2)ac	0.3 (4)cd	0.8 (1)bd	*P* < 0.001
Chilled	0.2 (5)†	0.5 (3)ab	0.7 (2)ac	0.4 (4)cd	0.8 (1)bd	*P* < 0.001
Tinned	0.1 (5)abc	0.1 (4)bd	0.5 (1)ade	0.2 (3)e	0.3 (2)c	*P* < 0.001
Dried	0.1 (5)†	0.3 (3)ab	0.6 (1)ac	0.2 (4)cd	0.5 (2)bd	*P* < 0.001
Ready meal type:						
Ethnic	0.2 (5)abc	0.4 (3)ad	0.7 (1)bde	0.3 (4)e	0.5 (2)c	*P* < 0.001
Healthy	0.1 (5)abc	0.2 (3)ad	0.6 (1)bde	0.2 (4)e	0.4 (2)c	*P* < 0.001
Traditional	0.2 (5)a	0.5 (3)	0.9 (1)†	0.5 (4)	0.6(2)a	*P* < 0.001
Vegetarian or meat free	0.1 (5)†	0.2 (4)	0.6 (1)†	0.3 (3)	0.3 (2)	*P* < 0.001
Organic	0.0 (5)a	0.1 (2)a	0.4 (1)†	0.1 (4)	0.1 (3)	*P* < 0.001
Fish-based	0.1 (5)a	0.2 (2)a	0.5 (1)†	0.1 (4)	0.2 (3)	*P* < 0.001
Pizza	0.3 (5)†	0.5 (4)ab	0.9 (1)ac	0.5 (3)cd	0.8 (2)bd	*P* < 0.001

576 Rank order for reported behaviour in brackets ("1" = highest reported consumption frequency, "5" = lowest reported
577 consumption frequency). † Indicates that the mean frequency is statistically different from all other groups. Pairs with the same
578 letter denote significantly different means.

579 **Table 6:** Demographic characteristics by cluster membership

	Epicures (*n* = 135)	Traditional consumers (*n* = 255)	Casual consumers (*n* = 246)	Food detached consumers (*n* = 151)	Kitchen evaders (*n* = 141)	*P*-value
Male	35 (25.9%)	68 (26.7%)	96 (39.0%)	47 (31.1%)	32 (22.7%)	*P* = 0.004
Female	100 (74.1%)	187 (73.3%)	150 (61.0%)	104 (68.9%)	109 (77.3%)	
Average Age (yrs) (SEM)	30.3 (0.5)	30.5 (0.4)	29.5 (0.4)	30.9 (0.5)	28.5 (0.5)	*P* = 0.004
Highest level of education:						
G.C.S.E.	10 (7.4%)	43 (16.9%)	52 (21.1%)	34 (22.5%)	29 (20.6%)	*P* = 0.002
AS/A level	29 (21.5%)	48 (18.8%)	62 (25.2%)	34 (22.5%)	46 (32.6%)	
Further Education	20 (14.8%)	39 (15.3%)	32 (13.0%)	25 (16.6%)	19 (13.5%)	
Degree	56 (41.5%)	93 (36.5%)	76 (30.9%)	48 (31.8%)	42 (29.8%)	
Postgraduate	20 (14.8%)	32 (12.5%)	24 (9.8%)	10 (6.6%)	5 (3.5%)	
Annual Household Income (£) (SEM)	39,342 (3,527)	33,392 (1,188)	31,423 (1,429)	29,500 (1,458)	24,989 (1,335)	*P* <0.001

580

581 **Table 7:** Household structure by cluster membership

	Epicures (*n* = 135)	Traditional consumers (*n* = 255)	Casual consumers (*n* = 246)	Food detached consumers (*n* = 151)	Kitchen evaders (*n* = 141)	*P*-value
No. of people in household:						
1	17 (12.6%)	33 (12.9%)	26 (10.6%)	23 (15.2%)	28 (19.9%)	*P* < 0.050
2	54 (40.0%)	80 (31.4%)	58 (23.6%)	34 (22.5%)	49 (34.8%)	
3	31 (23.0%)	61 (23.9%)	72 (29.3%)	37 (24.5%)	29 (20.6%)	
4	17 (12.6%)	56 (22.0%)	57 (23.2%)	40 (26.5%)	24 (17.0%)	
5	13 (9.6%)	15 (5.9%)	25 (10.2%)	11 (7.3%)	7 (5.0%)	
6 or more	3 (2.2%)	10 (4.0%)	8 (3.2%)	6 (4.0%)	4 (2.8%)	
Mean household size (SEM)	2.7 (0.1)	2.9 (0.1)	3.1 (0.1)	3.0 (0.0)	2.6 (0.1)	*P* = 0.007

582

583 **Table 8:** Percentage ownership of kitchen equipment by cluster membership (rank order)

	Epicures	Traditional consumers	Casual consumers	Food detached consumers	Kitchen evaders
Microwave	88.1% (5)	92.2% (3)	95.1% (1)	90.7% (4)	92.2% (2)
Dishwasher	43.7% (2)	41.2% (3)	43.9% (1)	37.1% (4)	25.5% (5)
Food processor	65.9% (1)	49.8% (2)	39.8% (3)	33.8% (4)	20.6% (5)
Ice cream maker	14.1% (1)	9.0% (3)	10.2% (2)	4.0% (4)	0.7% (5)
Cappuccino/Espresso maker	30.4% (1)	28.2% (2)	24.4% (3)	15.9% (4)	14.9% (5)
Bread maker	27.4% (1)	22.7% (2)	22.0% (3)	18.5% (4)	8.5% (5)
Electric knife	11.9% (2)	10.6% (4)	13.8% (1)	11.3% (3)	5.7% (5)
Sandwich toaster	51.1% (3)	60.0% (1)	57.3% (2)	51.0% (4)	46.8% (5)
Electric potato peeler	0.7% (5)	3.1% (3)	4.5% (1)	3.3% (2)	1.4% (4)
Juicer	27.4% (3)	31.4% (2)	32.9% (1)	17.9% (4)	14.9% (5)

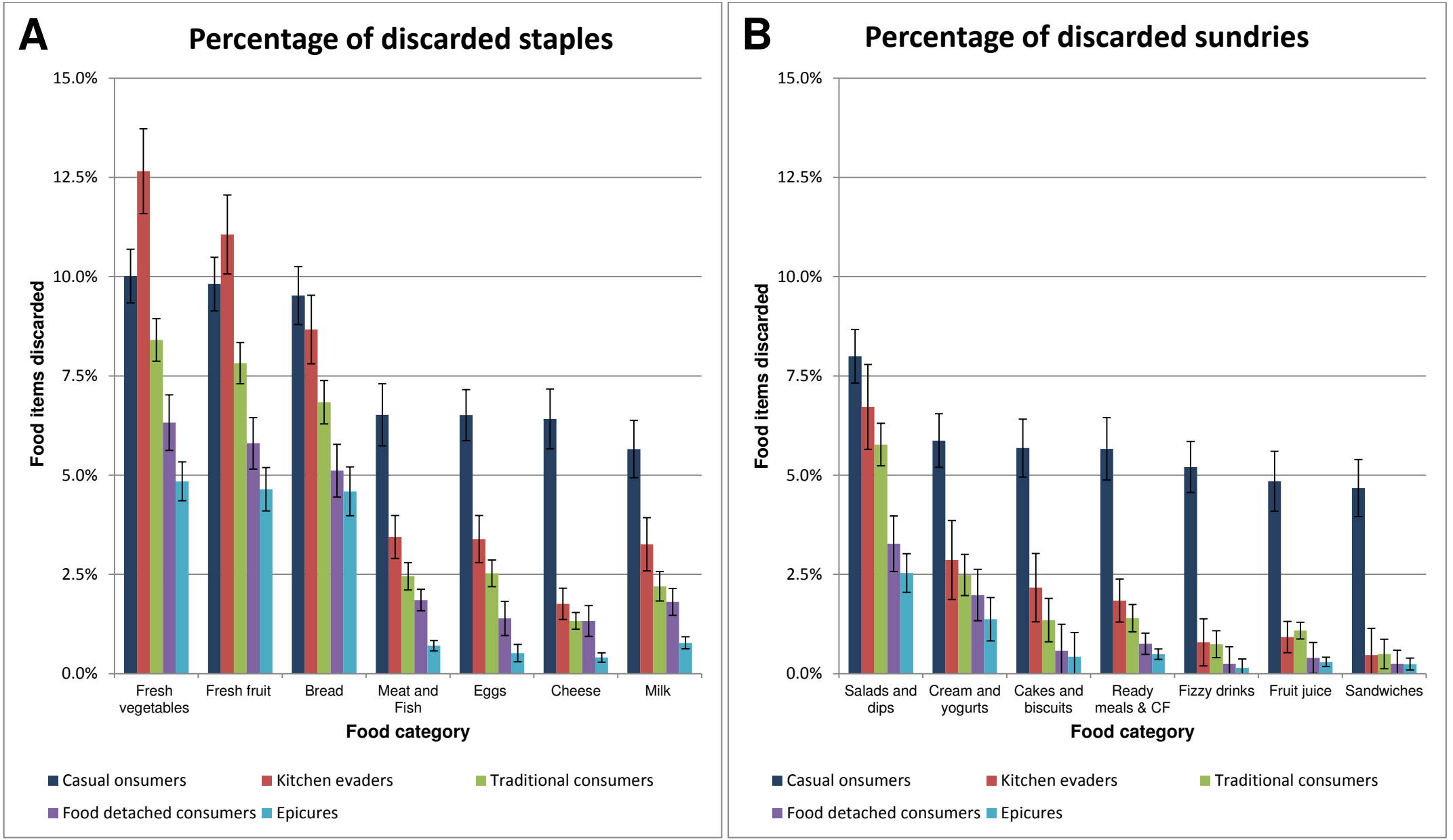
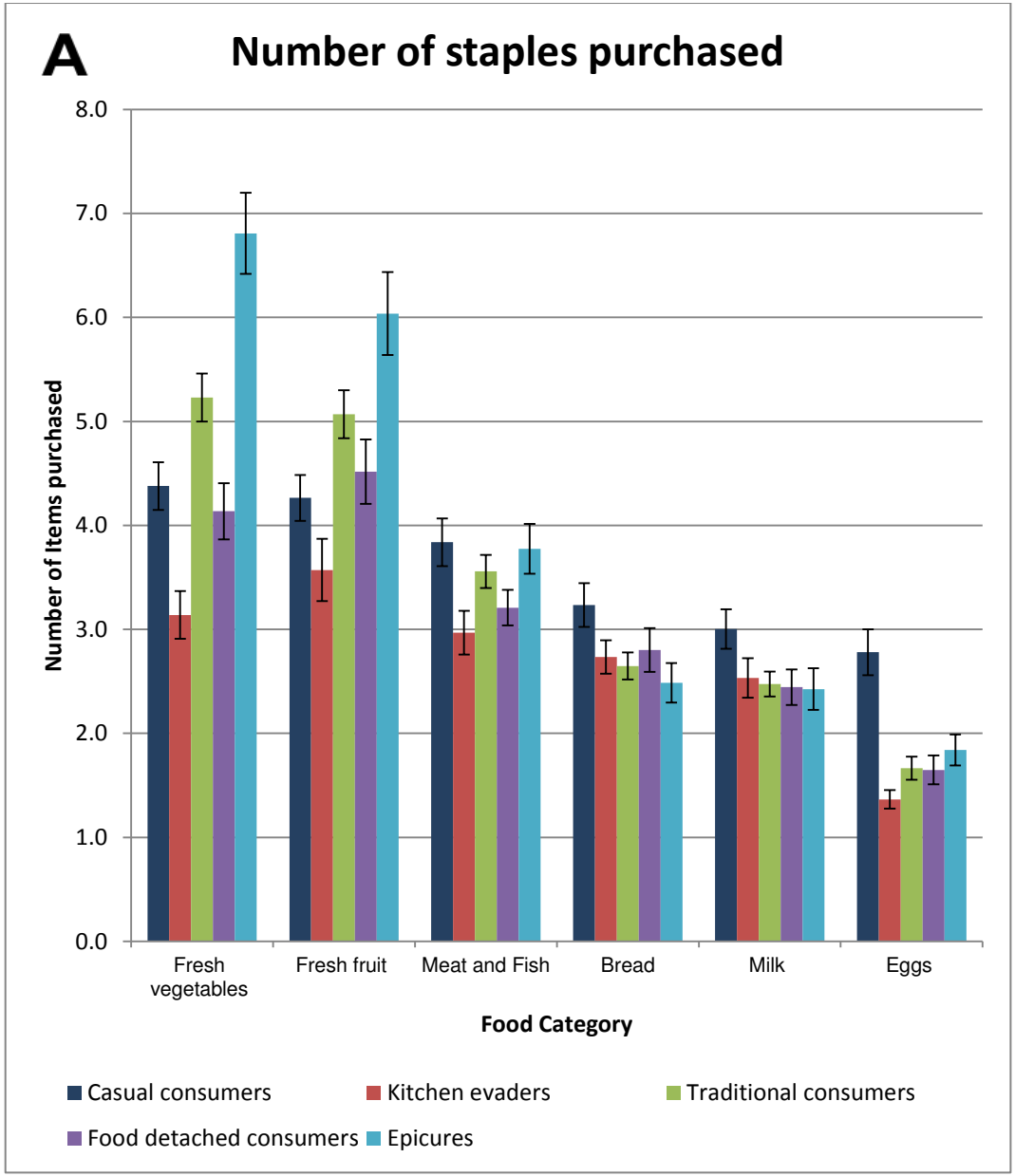
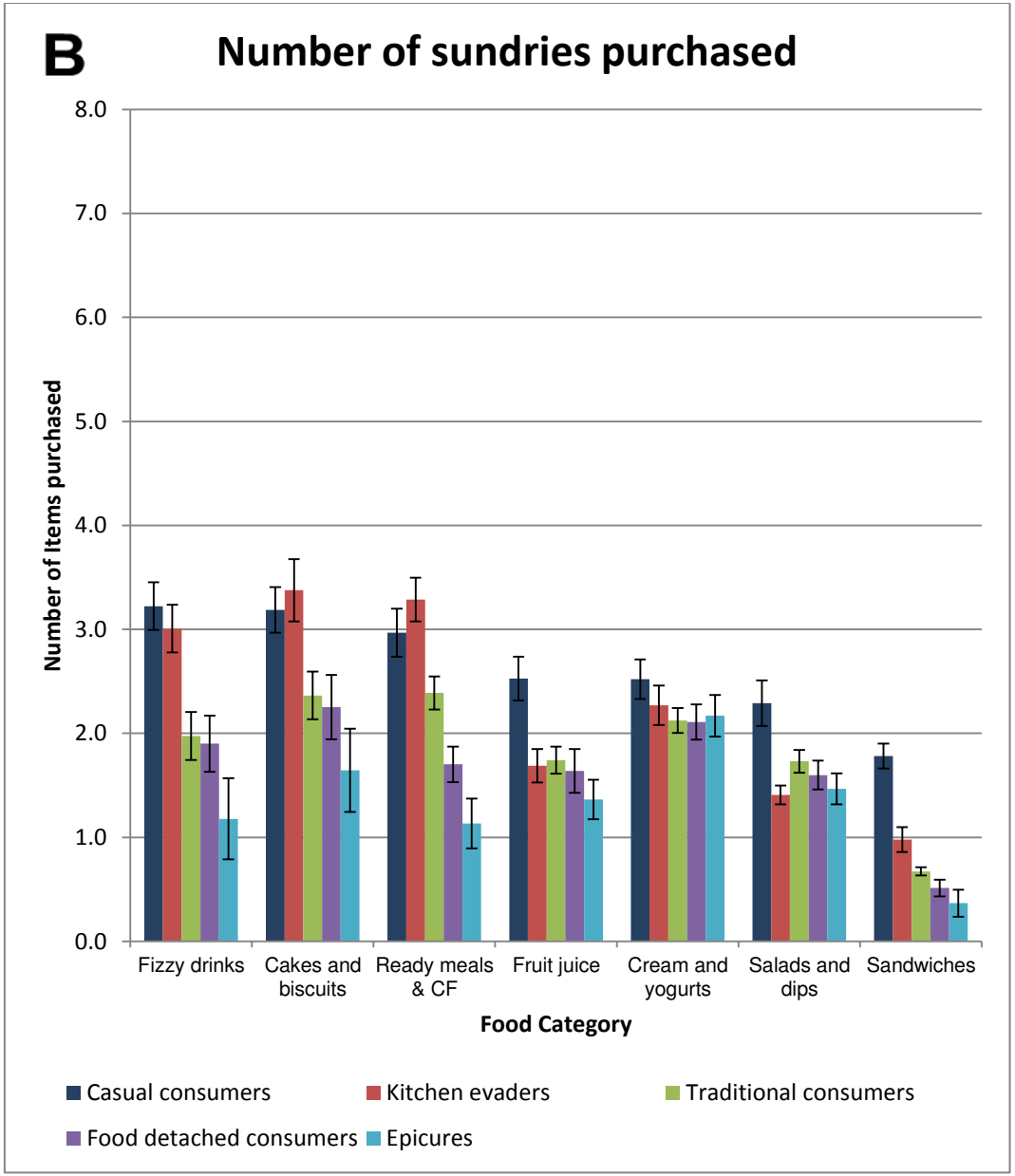


Figure 1: Percentage of food waste by cluster membership

CF = convenience food; Error bars show standard error of mean

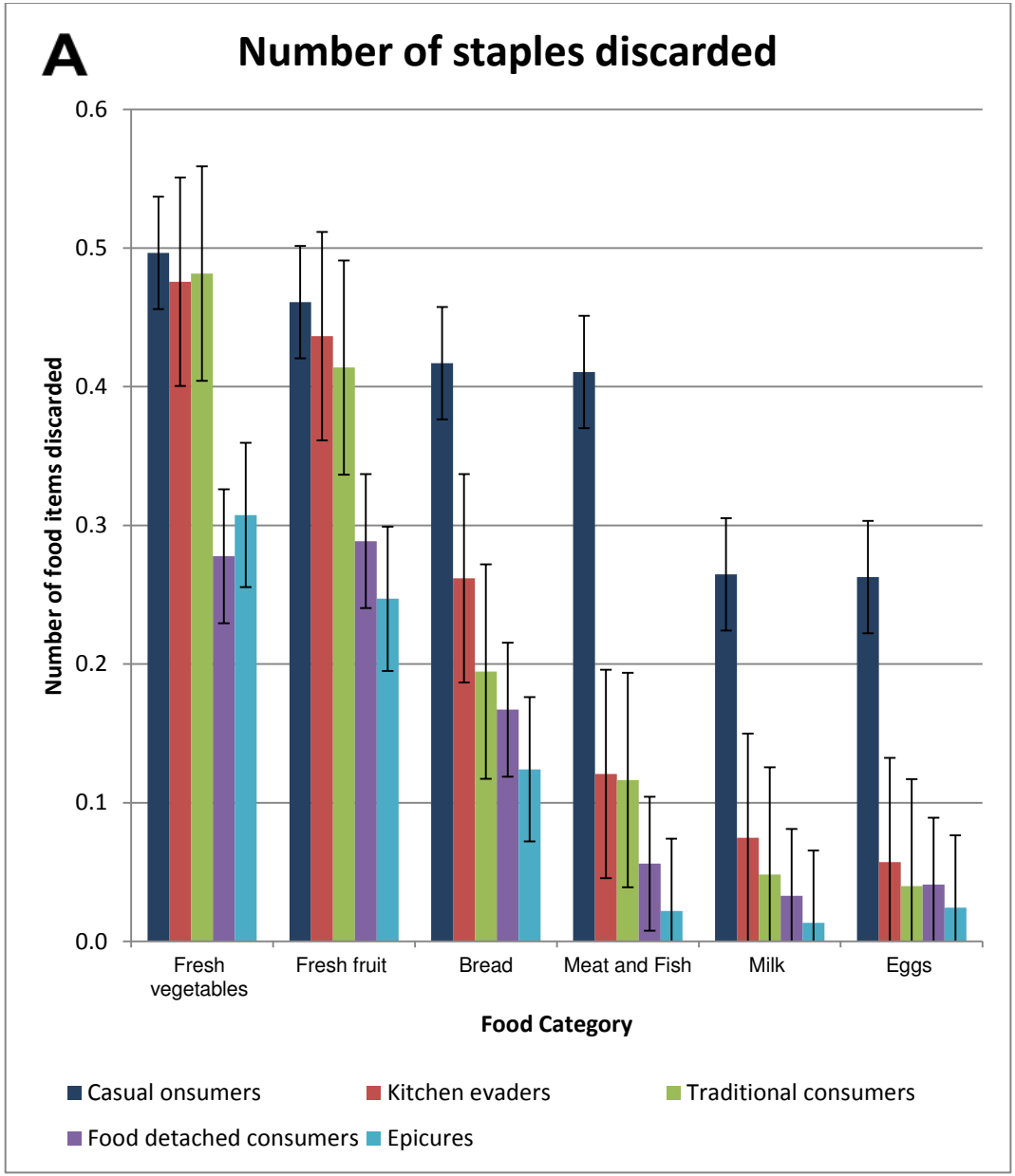




587

588 **Figure 2:** Number of food items purchased by cluster membership

589 CF = convenience food; Error bars show standard error of mean



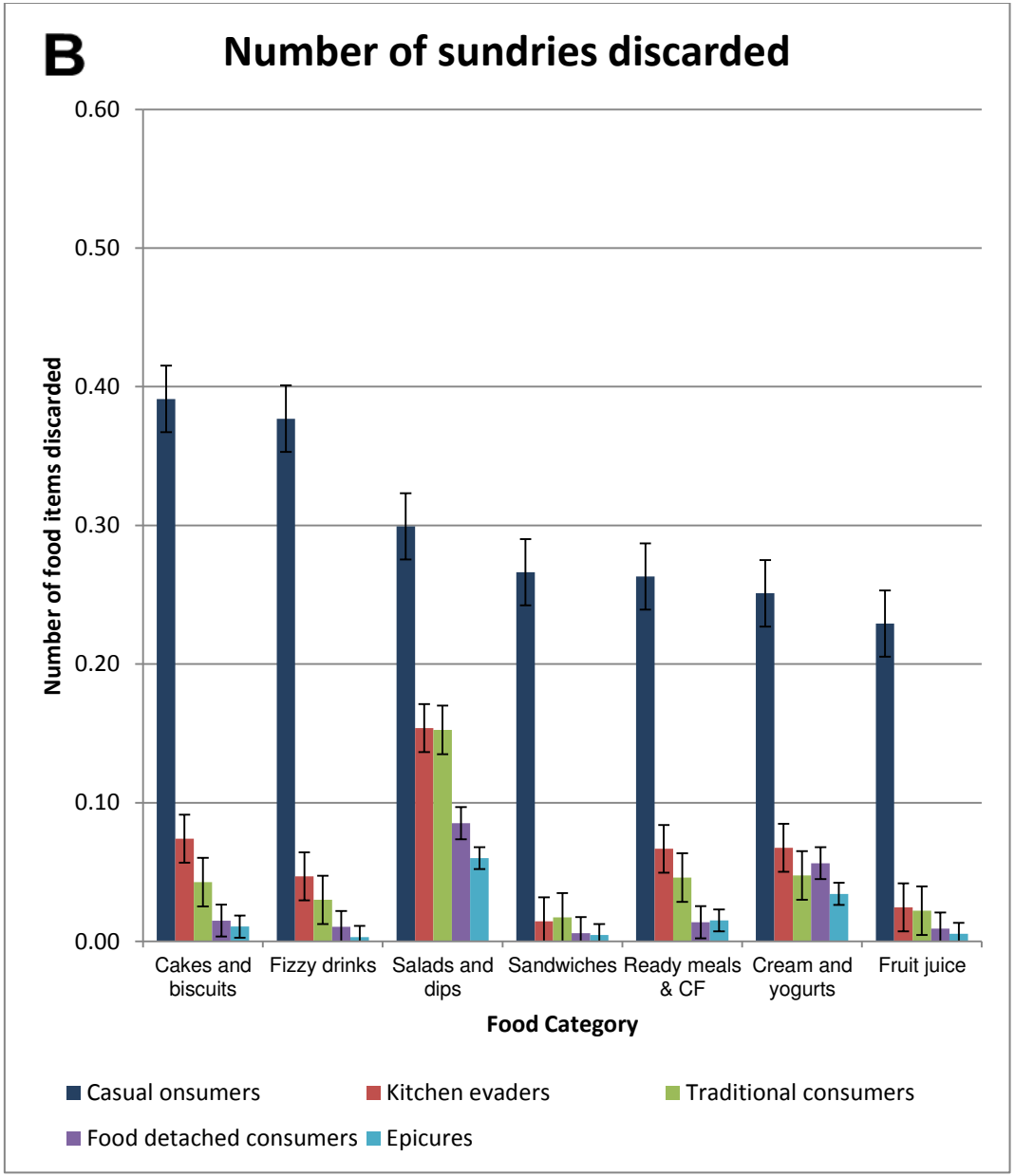


Figure 3: Number of food waste items by cluster membership

CF = convenience food; Error bars show standard error of mea

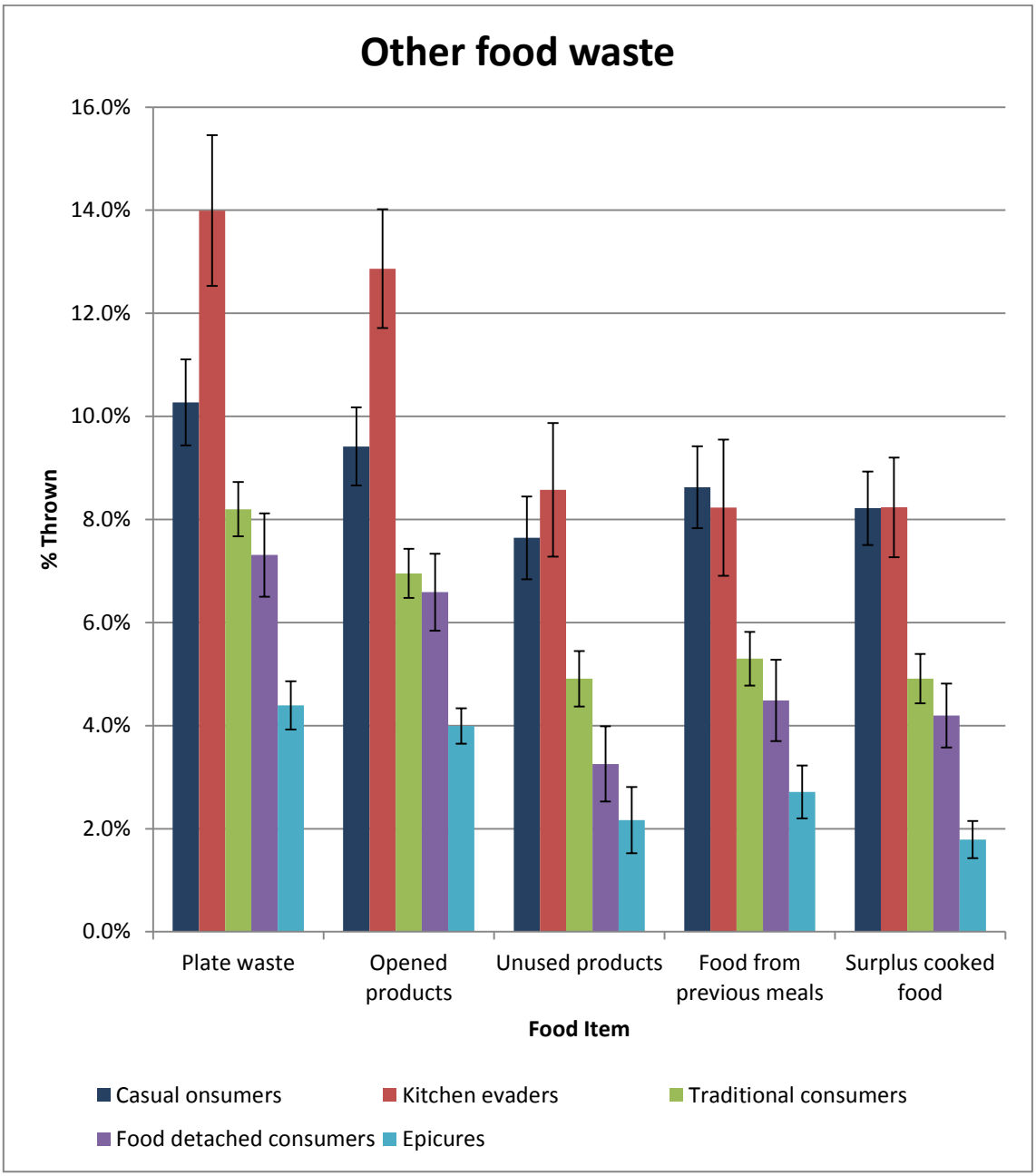


Figure 4: Percentage of other food waste by cluster membership

Error bars show standard error of mean

Appendix

Table A1: Statements underlying each lifestyle factor

Lifestyle Factor
1. Pro convenience food
We use a lot of ready-to-eat foods in our household
Convenience food products are very important to me
One of the reasons I use convenience foods is to reduce the amount of washing up
Convenience foods are nutritious
I choose easy, quick-to-prepare foods for weekday evening meals
Convenience foods allow me to have something that I wouldn't normally know how to cook
I am interested in convenience food products
Convenience foods are safe
I choose foods that don't create much, if any, washing up
Ready meals are a good thing
I feel very involved with convenience food products
2. Cooking satisfaction
I don't like spending too much time cooking
Cooking is a task that is best over and done with
I love spending time in the kitchen preparing food
Preparing meals fives me a lot of satisfaction
I enjoy preparing meals from scratch
3. Trying new food
I look for ways to prepare unusual meals
I love to try recipes from other countries
Recipes and articles about food from other cuisines make me experiment in the kitchen
I like to try new foods that I have never tasted before
I like to try out new recipes
4. Preference for fresh products
I prefer fresh products to tinned or frozen products
It is important to me that food products are fresh
I prefer to buy meat and vegetables fresh rather than frozen
I prefer to buy meat and vegetables fresh rather than tinned
5. Food shopping
Shopping for food does not interest me at all
I just love shopping for food
I try to do my food shopping as quickly as possible
I do not like to spend too much time shopping for food
Food shopping takes up too much of my time
6. Pressed for time
I am always looking to save time
I am often rushing to get everything done
I am always in a rush
7. Price conscious
It is important to me that I get quality for money
I compare prices between various brands of the same product in order to get the best value for money
I notice price changes in products I regularly buy
I always check prices, even on small items
I always try to get the best quality for the best price
8. Meal Plan
Usually I do not decide what to buy until I am in the shop
I always plan what we are going to eat a couple of days in advance
Before I go shopping for food, I make a list of everything I need
I make a shopping list to guide my food purchases
What we are going to have for dinner is very often a last-minute decision
Cooking needs to be planned in advance

599 **Table A1** (continued)

Lifestyle Factor
9. Propensity to waste ingredients
I find that I often have to throw away ingredients when cooking a meal from scratch
Throwing out leftover ingredients is all too common in my household
For me the solution to throwing out leftover ingredients is to buy convenience foods
I often find that I buy ingredients, use them once, then leave them in the cupboard and never use them again
10. Checking labels
Product information is highly important to me. I need to know what the food product contains
I compare product information labels to decide which brand to buy
I compare labels to select the most nutritious food
11. Social eating
Dining with friends is an important part of my social life
Going out for dinner is a regular part of our eating habits
Mealtimes are a good opportunity for conversation
I enjoy going to restaurants with family and friends
I we often get together with friends to enjoy an easy-to-cook casual dinner
When I serve dinner to friends, the most important thing is that we are together
12. Woman's work
It is the woman's responsibility to keep the family healthy by providing a nutritious diet
The responsibility for shopping and cooking should be equally shared between husband and wife
I consider the kitchen to be a woman's domain
13. Life stress
In the last month difficulties were piling up so high that I could not overcome them
Recently I have been unable to control the important things in my life
14. Regular microwave usage
I regularly use the microwave to cook my evening meal during the week
I regularly use the microwave to cook my evening meal at the weekend
15. Snacking in place of meals
I eat before I get hungry, which means that I am never hungry at meal times
In our house, snacking is more common than set mealtimes
I eat whenever I feel the slightest bit hungry
I snack a lot when I am at home on my own
16. Tendency not to cook when alone
I don't usually prepare a proper meal when it's just me
I don't enjoy cooking just for myself
17. Time benefits of convenience food
Takeaway meals are convenient
Convenience food saves time
Eating convenience food allows me more time to relax
Convenience food allows more time for other activities
Takeaway meals are a good last minute meal solution
Ready meals are a good back up to have at home
Ready meals are convenient
18. Specialist shoppers
I like buying food products in specialist shops where I can get expert advice (e.g. butcher, fishmonger, delicatessen)
I do not see any reason to shop in specialist food shops
I like to know what I am buying, so I often ask questions in shops when I buy food

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Lifestyle Factor
19. Cooking ability
Being praised for my cooking raises my self-esteem
I am an excellent cook
Eating is to me a matter of touching, smelling, tasting and seeing, all the senses are involved. It is a very exciting sensation
Meal preparation brings a bit of pleasure into my life
I am very creative when preparing meals
I choose meals that have been prepared by someone else because they do it much better than I can
I avoid preparing new dishes because I do not have the culinary skills to do so
20. Enjoyment of ready meals and takeaways
Eating ready meals is a pleasant experience
Eating takeaway meals is beneficial to me
Consuming convenience foods brings pleasure into my life
Takeaway meals are a good thing
Eating takeaway meals is a pleasant experience
Eating ready meals is beneficial to me
21. Influenced by advertising
I have more confidence in food products that I have seen advertised than in unadvertised products
I use the media to identify special offers on food products and plan to take advantage of them when I go shopping
I am influenced by what other people say about a food product
Information from advertising helps me to make better buying decisions
22. Organic food products
I make a point of using organic food products
I always buy organically grown food products when I can
I don't mind paying a premium for organic products
The naturalness of the food that I buy is an important quality to me
I try to avoid food products with additives
I prefer to buy natural products, i.e. products without preservatives
23. Value for money – convenience food
Convenience foods are not that expensive
Convenience foods are overpriced
Ready meals are good value for money
Takeaway meals are worth the extra cost
Convenience foods are not good value for money
24. Taste/appeal of food
The taste of food is important to me
When cooking taste is the most important consideration
Enjoying the taste of a food is important to me when I am eating
I enjoy a good meal
25. Fussy eaters within the family
There is always at least one person in my family who often needs a separately prepared meal
Certain members of the family have different tastes in food to the rest of the family
Certain members of the family are choosy about what they eat
26. Family help
The children or other members of the family always help in the kitchen e.g. they peel and cut up vegetables
My family helps with other mealtime chores, such as setting the table and washing up
When I do not really feel like cooking, I can get one of the other members of my family to do it
27. Breakdown of family mealtimes
In my house family members often have their meals at separate times
It is difficult for us to have a family meal together

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